is the figure of the mould that grows upon bread in a damp cellar. It consists of a single stem made up of cells placed one upon the other, and a single globular spore-case at the top. The spores are liberated when ripe and are blown to the four quarters of the world by the wind. Wherever they alight, circumstances being favorable,—as bread in a damp cellar,—they grow and become mould again. Compare this, which is one of the lowest of the Fungi, with a stamen (Fig. 120) growing in one of the most perfect of flowers. It has its filament (stem) supporting a case or sack (the anther) filled with pollen-grains (which I compare with the spores of the fungi) and which, when fully mature are liberated and scattered about by the wind, or are carried by insects. Under favorable circumstances (falling upon the stigma) they also grow and become new plants.

Fig. 120.

Stamen.

These examples are sufficient for the present purpose; they show clearly the existence of this important law in the vegetable, as well as in the animal kingdom. Many similar analogies might be found throughout the whole course of vegetable life, were it desirable to pursue the subject. We have here one more link between the two great kingdoms of organized nature, and another proof of the unity of design of the Creator.

ON THE PHYSICAL AND GEOLOGICAL CHARACTERISTICS OF THE GREAT DISMAL SWAMP, AND THE EASTERN COUNTIES OF VIRGINIA.

BY PROF. N. B. WEBSTER.

This remarkable morass, situated partly in Virginia and partly in North Carolina, is about forty miles long and from fifteen to twenty-five miles wide. The earliest account of a passage through the swamp is by Col. Byrd, who surveyed the state boundary line in 1728. Until this time, Col. Byrd wrote in his journal "this dreadful swamp was ever judged impassable."

About 1755 a Scotchman named Drummond, discovered the pond now bearing his name, and which has since been immortalized by Moore as the "Lake of the Dismal Swamp."

In 1763, George Washington, then twenty-one years of age, penetrated the swamp and in his own language "encompassed the whole." He camped one night on the eastern border of the lake, which is about seven miles long and five in width, and in a morning ramble before breakfast, made the interesting discovery that the water of several very small streams ran *out* of, instead of *into*, the lake. Washington wrote to Hugh Williamson that he had no doubt the water was running into some of the rivers of Albemarle Sound. The youthful surveyor had in fact discovered the source of Northwest River which runs into Currituck Sound.

Washington also ascertained that the surface of the lake was nearly level with the western edge of the swamp and considerably higher than the eastern border, or in other words that the swamp was neither a *hollow*, nor a *plain*, but a *hill-side*. More careful measurements since have shown that the surface of the lake is twenty-one feet higher than mid-tide, and twelve feet higher than the eastern border of the swamp.

Com. Barron and others sounded across the lake and found the depth, in the middle, to be fifteen feet, with a bottom of swamp-mud, covered in some places with white sand. The soil, if soil it can be called, taken one foot below the surface, contains more than 96 per cent. of organic matter. Workmen in the swamp assert that they can run a pole down from ten to fifteen feet in this soft mud or sponge. This sponge is really a peat when taken near the surface, and has been used as fuel. Shaded and kept moist by the dense growth of ferns, reeds, and juniper trees, which with their long deep roots stand firm in the trembling mud, the annual accumulation of vegetable growth does not decay, but gradually aids in raising the level of this growing bog. But when the mud is thrown up in ridges by the excavations for ditches and canals, it soon disappears by a slow oxidation.

The trees of past centuries, buried in the swamp, as well as the present growth are of great value for shingles, staves, and other purposes where durability is desired.

During dry seasons extensive fires prevail, not only burning the vegetation above the surface but the peaty soil itself, leaving holes and large depressions sometimes two feet in depth.

In this way the lake was probably formed. It is not to be supposed that the bed of the lake was thus burned to the depth of fifteen feet, but that at some remote time, the large area of its

bed was burned so low, that the water from succeeding rains filled it to a depth too great to allow vegetable growth, and that each succeeding year added to the height of the banks or relative depth of the lake. The perpendicular banks of the lake and the charred stumps that have been formed at the bottom, confirm this supposition. There are many proofs that the water supply of the lake is from the rainfall on the swamp and not from springs at the bottom. The water is remarkably pure except from vegetable matter infused, which gives it the color of weak tea and the name of juniper water. It is considered the best water for long sea voyages. Contrary to popular opinion abroad, the interior of the swamp is a very healthful locality.

Lyell briefly refers to the swamp in his "Travels in North America," and of course sees a confirmation of his theory of coal formations, viz.—"That ancient seams of coal were produced, for the most part, by terrestrial plants of all sizes, not *drifted*, but *growing on the spot.*"

That the Great Dismal was once much greater is evident from the deposits of peaty matter, swamp mud, and burnt stumps, below from twelve to fifteen feet of clay, at the distance of several miles from its present limits.

A specimen of charred wood was taken from a well about five miles from the swamp, and perhaps a mile from Suffolk, Va., on the line of the seaboard railroad. It was found as a part of a large stump, where it had grown in the midst of the black peaty soil, and below six and one-half feet of swamp mud, two feet of blue clay, and twelve feet of red clay. In the mud about the roots of the stump, white sand was found as at the bottom of the lake.

It is well known that the southeastern part of Virginia consists of two plateaus, one about eight or ten feet above the sea and the other from twenty-five to forty feet. The well referred to was dug near the eastern edge of the higher plateau, and the surface of the swamp forms an inclined plane from one plateau to the other.

This vast swamp appears to be retained above the level of the adjacent land in a way similar to the peat-mosses of Solway and Sligo, until they burst and overwhelmed the neighboring country. What known force but that combination of molecular forces known as capillarity can supply and sustain the waters of the lake and swamp above described?